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سه شنبه
۲۲ بهمن ۱۳۹۹

Tuesday 25
2025/03/25

۱۸, ۲۵

۱۲۰۲/۱/۵

تکلیف شماره ۱۵

آیا حاشی

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سوال ۱

$$t_1 + t_2 + t_3 = 11 \rightarrow t_1 + t_2 + t_3 = 11 \rightarrow t_1 + t_2 + t_3 = 11$$

$$t_1 \times t_2 \times t_3 = 95 \rightarrow t_1 \times t_2 \times t_3 = 95 \rightarrow t_1 \times t_2 \times t_3 = 95$$

$$t_1 = 1 \rightarrow t_2 \times t_3 = 95 \rightarrow t_2 \times t_3 = 95$$

$$\frac{K}{q} = t \rightarrow \frac{K}{q} (1 + q + q^2) = 11$$

$$K (1 + q + q^2) = 11q \rightarrow K + Kq + Kq^2 = 11q$$

$$Kq^2 + Kq - 11q + K = 0$$

$$Kq^2 - 10q + K = 0$$

$$\Delta = (-10)^2 - 4K^2 = 100 - 4K^2 = 100 - 4(25) = 0$$

$$q = \frac{10 \pm \sqrt{0}}{2K} \rightarrow \frac{10 \pm 0}{2 \times 5} = \frac{10}{10} = 1$$

$$\frac{10 \pm 0}{2 \times 5} = \frac{10}{10} = 1$$

$$q = \frac{1}{5} \rightarrow t_1 \times t_2 \times t_3 = 14 \times 5 \times 1 = 70$$

$$14 + 5 + 1 = 20$$

$$b^2 = a \cdot c \rightarrow (21^2 + 5)(21^2 - 5) = 42^2$$

$$21^2 - 21^2 + 5 \cdot 21^2 - 1 = 21^2 \rightarrow 21^2 = 21^2 + 10 \cdot 21^2 - 1$$

$$0 = 10 \cdot 21^2 - 1 \rightarrow 21^2 = \frac{1}{10} \rightarrow 21 = \frac{1}{\sqrt{10}}$$

$$21^2 = \frac{1}{10} / 21^2 + \frac{1}{10} = \frac{1}{10} / 21^2 - \frac{1}{10} = \frac{1}{10}$$

$$q = \frac{a_1}{a_r} = \frac{K}{1} = \frac{1}{K}$$

$$S_n = a \left[\frac{q^n - 1}{q - 1} \right] \Rightarrow 1 \times \left[\frac{1 - \left(\frac{1}{K}\right)^n}{1 - \frac{1}{K}} \right]$$

$$\Rightarrow \frac{1 - \frac{1}{K^n}}{1 - \frac{1}{K}} \Rightarrow S_n = \frac{1 - \frac{1}{K^n}}{1 - \frac{1}{K}}$$

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سوال ۳ ۱۴۰۴/۱/۶

$$1 + t_1 + t_1 r + t_1 r^2 + t_1 r^3 = \frac{121}{1}$$

$$\frac{q^{\infty} - 1}{q - 1} = \frac{121}{\cancel{121}^{\mu \varepsilon}} \rightarrow r = \frac{1}{\mu} \rightarrow 1 + \frac{1}{\mu} + \frac{\varepsilon}{9} + \frac{1}{27} + \frac{1}{1}$$

$$\frac{11 + 11\varepsilon + 11\mu + 11\varepsilon + 11}{11} = \frac{121}{11} \neq \frac{121}{11}$$

$$r = \frac{1}{\mu} \rightarrow \frac{11 + 27 + 9 + 1}{11} = \frac{121}{11}$$

$$S_{\infty} = a_1 \left[\frac{1 - q^{\infty}}{1 - q} \right] = 121 \times \left[\frac{1 - \frac{1}{27}}{1 - \frac{1}{\mu}} \right] = 121 \times \frac{26}{27} \times \frac{\mu}{\mu - 1} = 121$$

سوال ۴

$$a_1 = 1 \quad a_7 = 42$$

$$a_1 + 4d = 42 \rightarrow 4d = 41 \Rightarrow d = 10.25$$

$$a_7 = a_1 + 6d \Rightarrow 1 + 6(10.25) = 61.5$$

$$t_1 = 1 \quad t_7 = 42$$

$$t_1 \times r^6 = 42 \rightarrow r^6 = 42 \rightarrow r = \sqrt[6]{42} \quad t_7 = t_1 r^6 = 1 \times 42 = 42$$

$$A + B = 61.5 + 1 = 62.5$$

$$1 \times q^4 = 42 \rightarrow q = \pm \sqrt[4]{42}$$

$$\text{if } q = \sqrt[4]{42} \rightarrow B = 1 \times r^6 = 1$$

$$\rightarrow A + B = 62.5 + 1 = 63.5$$

$$\text{if } q = -\sqrt[4]{42} \rightarrow B = 1 \times (-r)^6 = 1$$

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سوال ۵
 $t_1 + (n-1)d = -24 + (n-1) \times \frac{1}{2}$

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 $-24, -\frac{9d}{2}$
 $+\frac{1}{2}$

$t_{101} = t_1 + 100d = -24 + 100 \times \frac{1}{2} = 26$

۱۲۸, ۷۴, ۳۲, ۱۶, ۸, ۴, ۲, ۱

$q^{m-n} = \frac{a_m}{a_n} \rightarrow q^{\frac{1}{2}} = \frac{1}{128} \rightarrow q = \frac{1}{2}$

سوال ۶
 $\begin{cases} t_v = t_1 + 2d \\ t_v = t_1 + 4d \\ t_q = t_1 + 1d \end{cases} \Rightarrow (t_1 + 4d)^2 = (t_1 + 2d)(t_1 + 1d)$

$t_1^2 + 8d^2 + 12dt = t_1^2 + 3dt + 2d^2$

$2d(a+10d) = 0 \rightarrow d = 0$
 $2ad + 20d^2 = 0 \rightarrow 2d(a+10d) = 0$
 $a+10d = 0 \Rightarrow a = -10d$

$d = \frac{a}{10}$
 $d = \frac{a}{10}$

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سوال ۷
 $\begin{cases} t_v = t_1 + d \\ t_v = t_1 + 3d \\ t_1 = t_1 + vd \end{cases} \Rightarrow (t_1 + 3d)^2 = (t_1 + d)(t_1 + vd)$

$t_1^2 + 9d^2 + 6dt = t_1^2 + vdt + dt + vd^2$

$9d^2 - vd^2 = 11td - 4td$

$2d(d-t) = 0 \rightarrow d = t$

$t_1 = 2d, 2d, 1d$
 $2d = \frac{1}{2} \rightarrow d = \frac{1}{4}$
 $t_1 = \frac{1}{2}$

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سوال ۸ ۱۴۰۴/۱/۹

① $a, ar, ar^2, ar^3, \dots \rightarrow {}^{\text{م}}(ar) = r(ar^2), ar^3$

① $Far^2 = {}^{\text{م}}ar + ar^3 \rightarrow {}^{\text{م}}r^2 = {}^{\text{م}}r + r^3 \rightarrow Fr^2 - {}^{\text{م}}r - r^3 = 0$
 چون دنباله منتهی است
 باید در نقطه صفر متوقف شود

① $r=0 \rightarrow$ دنباله ثابت است $\times$
 چون خط اول از سر صفر

① $r=1 \rightarrow$ دنباله ثابت است $\times$

① $r=3$ ✓

سوال ۹

① $1, \frac{1}{\varepsilon}, \dots \rightarrow d = \frac{1}{\varepsilon} - 1 = \frac{1-\varepsilon}{\varepsilon} = -\frac{1}{\varepsilon}$

① $a_n = 1 + (n-1)d \rightarrow 1 - \frac{(n-1)}{\varepsilon} \rightarrow a_{\varepsilon} = 1 - \frac{\varepsilon}{\varepsilon} = \frac{\varepsilon}{\varepsilon} + n$
 $\rightarrow a_n = 1 - \frac{1}{\varepsilon} = \frac{1}{\varepsilon} + n$
 $\rightarrow a_{13} = 1 - \frac{13}{\varepsilon} = 1 - 3 = -1 + n$

① $\rightarrow (-4, -5, -4, 2, 5) \rightarrow q = \frac{a_2}{a_1} = \frac{-5}{-4} = \frac{5}{4}$
 $\left(\frac{1}{\varepsilon} + n\right)^p = (-1 + n) \left(\frac{5}{\varepsilon} + n\right)$

① $\frac{1}{14} + n^2 + \frac{n}{2} = \frac{1}{2} + \frac{5}{\varepsilon}n - n - \frac{5}{\varepsilon} \rightarrow \frac{1}{14} + \frac{n}{\varepsilon} = -\frac{5}{\varepsilon}$

① $\frac{n}{\varepsilon} = -\frac{5}{\varepsilon} - \frac{1}{14} \rightarrow \frac{n}{2} = \frac{-2-1}{14} = \frac{-3}{14} \rightarrow n = \frac{-21}{\varepsilon}$

$-1 + \frac{21}{\varepsilon} = \frac{-10}{\varepsilon} / \frac{1}{\varepsilon} - \frac{21}{\varepsilon} = \frac{-10}{\varepsilon} - \frac{21}{\varepsilon} = \frac{-31}{\varepsilon} = \frac{-5}{\varepsilon} \rightarrow d = \frac{4}{5}$

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سوال فی MARCH فروردین

$$a + ar^3 + ar^4 = 7^3 \rightarrow a(1 + r^3 + r^4) = 7^3$$

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حساب $a, ar^3, ar^4, \dots$

$$\begin{cases} A_2 = A_1 + d \Rightarrow ar^3 = a + d \\ A_{10} = A_1 + 9d \Rightarrow ar^9 = a + 9d \end{cases} \quad \begin{cases} ar^4 = a + 9(ar^3 - a) \\ ar^4 = a + 9ar^3 - 9a \end{cases}$$

عبارات درمنا متناظر خستند چپ مرهواند عت باسند!

$$\begin{aligned} q=1 &\rightarrow 3a = 7^3 \rightarrow a = \frac{7^3}{3} \\ aq^9 - a = d &\xrightarrow{q=1} \frac{7^3}{3} - \frac{7^3}{3} = 0 \rightarrow d=0 \\ r^3 &= 9r^3 - 1 \end{aligned}$$

$$r^4 = 9r^3 - 1$$

$$r^4 - 9r^3 + 1 = 0 \rightarrow (r^3 - 1)(r - 1) = 0 \rightarrow \begin{cases} r^3 = 1 \rightarrow r = 1 \\ r = 1 \end{cases}$$

$$a(1 + 1 + 9) = 7^3$$

$$ax7^3 = 7^3 \rightarrow a = 1$$

$$\rightarrow A_1 = 1$$

$$\rightarrow A_2 = 1$$

$$\rightarrow A_{10} = 74$$

$$1 - 1 = 0 = d$$

✓